

TRACHEAL AIRWAY APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to an apparatus for ensuring that the tracheal airway remains open, when a person suffers damage at the tracheal airway area or in other similar cases.

When a person is badly damaged in the throat area by traffic accident or the like, that person frequently has a difficulty in breathing and it sometimes endangers the life of the person. For this reason, at the site of the accident, it is extremely urgent to ensure that the airway remains open. A typical conventional apparatus for ensuring an open airway comprises an insert tube and a stylet. The stylet is formed, for example, of an aluminum core covered with a synthetic resin material so that it has a semi-hard property. Owing to this feature, the stylet can be manually bent and this bending contour of the stylet can be maintained without allowing its returning to the original contour due to its resiliency. The operator inserts the bent stylet, which is already received in the insertion tube, into the airway from the mouth of the patient (person who met the traffic accident, etc.) while observing the airway through a throat mirror at a position away from the patient. After the stylet has been fully inserted into the airway, only the stylet is withdrawn leaving the insert tube in the airway, and oxygen is supplied to the patient's lungs through the insert tube. The above-mentioned apparatus is sometimes used for other purposes than in the case of a damaged airway, such as oxygen inhalation and anesthetic gas inhalation.

In the tracheal airway apparatus thus constructed, much difficulty is often encountered in inserting the insert tube with the stylet received therein into the patient's airway because the airway cannot be seen clearly through the throat mirror despite an effort to open the patient's mouth widely. Therefore, only a well trained expert can become an operator of this type of an apparatus.

Japanese Laid-Open Patent Application No. Hei 6-217933 discloses a technique for inserting an insert tube with a flexible insert portion of an endoscope received therein into the airway while observing the airway through the endoscope. However, since the insert portion of the endoscope is flexible, it is difficult to insert the insert portion of the endoscope and insert tube smoothly into the airway particularly when the patient's throat area is damaged.

The above-mentioned Japanese Laid-Open Patent Application No. Hei 6-217933 also discloses an improved tracheal airway apparatus. As best seen in FIG. 3 of the above publication, the tracheal airway apparatus includes an endoscope and a stylet. The endoscope includes a body and a flexible insert portion extending from the body. A guide channel is formed in the endoscope. The guide channel has an inlet port opening to the body and an outlet port opening to a distal end face of the insert portion. In a state where the stylet is inserted into the guide channel, the insert portion is bent so as to be easily inserted into the airway. This bent form or contour of the insert portion is maintained by the stylet. With this bent contour, the insert portion of the endoscope is inserted into the airway while observing the airway. Thereafter, the stylet is withdrawn from the guide channel and a gas such as oxygen is supplied through the guide channel. As apparent from the description so far made, the endoscope is used as an insert tube in a general tracheal airway apparatus. However, a sectional flow area of the guide channel used for supplying a gas is small. Further, the stylet is formed to have a thin design in order to be smoothly inserted into the guide channel. Since the contour maintain-

ing ability of the stylet is decreased, much difficulty is encountered when the insert portion of the endoscope is inserted into the airway particularly in the case where the patient's throat area is damaged.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a tracheal airway apparatus which can be easily inserted into the airway and in which gas can be supplied in a stable manner.

According to the present invention, there is provided a tracheal airway apparatus comprising:

- (a) an insert tube to be inserted into a tracheal airway;
- (b) an endoscope including a body and an insert portion extending forwardly of the body and inserted into the insert tube; and
- (c) the insert portion of the endoscope including an outer tube and an inner tube received in the outer tube, the inner tube being flexible and receiving illumination light transmission means and image transmission means, the outer tube having a semi-hard property, a rear end of the outer tube being detachably attached to a distal end part of the body through connection means.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view, partly in section, of a tracheal airway apparatus according to one embodiment of the present invention;

FIG. 2 is a side view, partly in section, of an endoscope used in the apparatus of FIG. 1;

FIG. 3 is a perspective view of an insert tube structure used in the apparatus of FIG. 1;

FIG. 4 is a side view, partly in section, of the endoscope in a state where a sheath is separated therefrom;

FIG. 5 is an enlarged sectional view showing a front part of a body of the endoscope and a rear end part of an insert portion;

FIG. 6 is an enlarged sectional view showing a distal end part of the insert portion of the endoscope;

FIG. 7 is an enlarged sectional view of the sheath;

FIG. 8 is an enlarged sectional view showing another example of a front part of the body of the endoscope;

FIG. 9 is a side view, partly in section, of a tracheal airway apparatus, having a different fitting mode of the insert tube structure;

FIG. 10 is a perspective view of a fixing sleeve used in the embodiment of FIG. 9;

FIG. 11 is a sectional view showing a further different fitting mode of the insert tube structure;

FIG. 12 is a sectional view showing a still further different fitting mode of the insert tube structure; and

FIG. 13 is a perspective view of a fixing sleeve used in the embodiment of FIG. 12.

DETAILED DESCRIPTION OF THE EMBODIMENT

One embodiment of a tracheal airway apparatus will now be described with reference to FIGS. 1 to 7.

As shown in FIG. 1, the tracheal airway apparatus includes an insert tube structure A to be inserted into a tracheal airway of a patient and an endoscope B for visually observing the inner wall of the tracheal airway when the insert tube structure A is inserted into the tracheal airway.